

CLAIMS

1. A method for scheduling in a mobile communication system a plurality of priority flows data of which is transmitted by a plurality of mobile terminals via a plurality of dedicated uplink channels to a base station, wherein each mobile terminal transmits data of at least one of said plurality of priority flows via one of said plurality of dedicated uplink channels, the method comprising the steps of:
 - associating at the base station each of the plurality of priority flows with a set of QoS parameters,
 - receiving at the base station scheduling requests for at least a part of said plurality of dedicated uplink channels, wherein a scheduling request comprises a flow identifier indicating a priority flow data of which is to be transported on the respective dedicated uplink transport channel,
 - associating by the base station the flow identifiers of the plurality of scheduling requests with the set of QoS parameters of the respective identified priority flow and
 - scheduling by the base station those dedicated uplink channels transporting data of priority flows for which a scheduling request has been received based on the associated set of QoS parameters indicated by the flow identifier.
2. The method according to claim 1, wherein the QoS parameters comprise the transmission mode associated with the data of a respective priority flow.
3. The method according to claims 2, wherein the transmission mode indicates whether data of the respective priority flow is transmitted applying an additional gain factor.
4. The method according to one of claims 1 to 3, wherein a scheduling request further comprises information on the buffer occupancy and on the available transmission power at a mobile terminal from which the scheduling request is received.
5. The method according to one of claims 1 to 4, wherein the scheduling request received by the base station is transmitted via MAC control signaling.

6. The method according to claim 1, wherein a priority flow is a MAC-d flow or a priority queue of a mobile terminal.
7. The method according to claim 1, further comprising the step of transmitting a scheduling assignment from the base station to mobile terminals from which a scheduling request has been received at the base station, wherein a scheduling assignment indicates the uplink resources allocated to the dedicated uplink channel of the respective mobile terminal.
8. The method according to claim 1 or 7, further comprising the step of receiving at the base station at least one configuration message comprising said QoS parameters.
9. The method according to claim 8, wherein the configuration message is received from a network element terminating the radio resource control signaling of at least one of said plurality of mobile terminals.
10. The method according to claim 8 or 9, wherein each priority flow is associated to at least one radio bearer between the respective mobile terminal and the network element terminating the radio resource control signaling and the method further comprising the step of mapping a set of QoS parameters of a radio bearer to a set of QoS parameters of an associated priority flow.
11. The method according to claim 10, wherein the mapping of QoS parameters comprises taking into account uplink delays on the interface between the base station and the network element terminating the radio resource control signaling.
12. The method according to one of claims 8 to 11, wherein the set of QoS parameters of a priority flow is received by the base station in a radio link setup message or a radio link reconfiguration message from the network element terminating the radio resource control signaling.
13. The method according to one of claims 1 to 12, wherein data of multiple priority flows is multiplexed onto a single dedicated uplink channel in a transmission time interval by a mobile terminal and wherein the flow identifier in a scheduling request for said single dedicated uplink channel comprises a flow identifier of the priority flow having the highest QoS demands.

14. The method according to one of claims 1 to 13, wherein multiple priority flows are multiplexed onto a single dedicated uplink channel

the method further comprises the steps of signaling for each priority flow a set of QoS parameters to the respective mobile terminal providing data of the priority flow via a dedicated uplink channel and
taking the signaled QoS parameters into account when performing scheduling related functions at the mobile terminal.
15. The method according to claim 14, wherein the scheduling related functions comprises the transmission of scheduling requests for the dedicated uplink channel and/or a transport format selection for uplink data transmission on a dedicated uplink channel.
16. The method according to claim 14 or 15, further wherein a set of QoS parameters is provided to a respective mobile terminal within a radio bearer setup message or a radio bearer reconfiguration message.
17. The method according to one of claims 1 to 16, wherein the QoS parameters associated to a priority flow comprise at least one of a transfer delay, a guaranteed bit rate, a traffic handling priority, a service type identification, a traffic class and a reordering release timer of the reordering buffer in the MAC entity.
18. The method according to one of claims 1 to 17, wherein a scheduling request further comprises a service type indicator indicating the transmission of data of a priority flow carrying a delay-critical service on the dedicated uplink channel.
19. The method according to claim 18, wherein in case the service type indicator of the scheduling request indicates the transmission of a delay-critical service, the method further comprises the step of considering a predetermined gain factor to be additionally applied to uplink transmission on the respective dedicated uplink channel when scheduling the mobile terminals from which a scheduling request has been received at the base station.

20. A base station for scheduling in a mobile communication system a plurality of priority flows of which data is transmitted by a plurality of mobile terminals via a plurality of dedicated uplink channels to the base station, wherein each mobile terminal transmits data of at least one of said plurality of priority flows via one of said plurality of dedicated uplink channels, said base station comprising:
- processing means for associating each of the plurality of priority flows with a set of QoS parameters,
- communication means for receiving scheduling requests for at least a part of said plurality of dedicated uplink channels, wherein a scheduling request comprises a flow identifier indicating a priority flow of which data is to be transported on the respective dedicated uplink transport channel,
- wherein the processing means is adapted to associate the flow identifiers of the plurality of scheduling requests with the set of QoS parameters of the respective identified priority flow and
- a scheduler for scheduling those dedicated uplink channels transporting data of priority flows for which a scheduling request has been received based on the set of QoS parameters indicated by the flow identifier.
21. The base station according to claim 20, further comprising means adapted to perform the steps of the method according to one of claims 1 to 19.
22. A method for requesting in a mobile communication system uplink resources for transmissions on a dedicated uplink channel, wherein a mobile terminal transmits data of at least one priority flow via the dedicated uplink channel to a base station, and wherein each priority flow is associated to a set of QoS parameters at the base station, the method comprising the steps of:
- transmitting from the mobile terminal a scheduling request for the dedicated uplink channel to the base station, wherein the scheduling request comprises a flow identifier indicating a priority flow of which data is to be transported on the dedicated uplink transport channel and
- receiving at the mobile terminal a scheduling assignment from the base station for the dedicated uplink channel.

23. A mobile terminal in a mobile communication system transmitting data of at least one priority flow via a dedicated uplink channel to a base station, wherein each priority flow is associated to a set of QoS parameters at the base station, said mobile terminal comprising:
- communicating means for transmitting to the base station a scheduling request for the dedicated uplink channel, and
- receiving a scheduling assignment from the base station for the dedicated uplink channel,
- wherein the scheduling request comprises a flow identifier indicating a priority flow of which data is to be transported on the dedicated uplink transport channel.
24. The mobile terminal according to claim 23, wherein a priority flow is a MAC-d flow or a priority queue of the mobile terminal.
25. A mobile terminal according to claim 23 or 24, further comprising means to perform the method according to one of claims 1 to 19.
26. A computer readable storage medium for storing instructions that when executed by a processor of a base station in a mobile communication system cause the base station to schedule a plurality of priority flows of which data is transmitted by a plurality of mobile terminals via a plurality of dedicated uplink channels to a base station, wherein each mobile terminal transmits data of at least one of said plurality of priority flows via one of said plurality of dedicated uplink channels, by:
- associating at the base station each of the plurality of priority flows with a set of QoS parameters,
- receiving at the base station scheduling requests for at least a part of said plurality of dedicated uplink channels, wherein a scheduling request comprises a flow identifier indicating a priority flow of which data is to be transported on the respective dedicated uplink transport channel,

associating by the base station the flow identifiers of the plurality of scheduling requests with the set of QoS parameters of the respective identified priority flow and

scheduling by the base station those dedicated uplink channels transporting data of priority flows for which a scheduling request has been received based on the set of QoS parameters indicated by the flow identifier.

27. The computer readable storage medium according to claim 26, further storing instruction that when executed by the processor cause the base station to perform the steps of the method according to one of claims 1 to 19.
28. A computer readable storage medium for storing instructions that when executed by a processor of a mobile terminal in a mobile communication system cause the mobile terminal to request uplink resources for transmissions on a dedicated uplink channel, wherein the mobile terminal transmits data of at least one priority flow via the dedicated uplink channel to a base station, and wherein each priority flow is associated to a set of QoS parameters at the base station, by:
 - transmitting to the base station a scheduling request for the dedicated uplink channel, wherein the scheduling request comprises a flow identifier indicating a priority flow of which data is to be transported on the dedicated uplink transport channel and
 - receiving a scheduling assignment from the base station for the dedicated uplink channel.
29. The computer readable storage medium according to claim 28, further storing instruction that when executed by the processor cause the mobile terminal to perform the steps of the method according to one of claims 1 to 19.
30. A method for indicating uplink resources to be used for transmissions on a dedicated uplink channel in a mobile communication system, the method comprising the steps of:

transmitting from the mobile terminal to the base station a scheduling request for the dedicated uplink channel, wherein a scheduling request comprises a service type indicator indicating the transmission of data of a priority flow carrying a delay-critical service on the dedicated uplink channel and

receiving at the mobile terminal a scheduling assignment from the base station for the dedicated uplink channel.

31. The method according to claim 30, further comprising the step of additionally applying a predetermined gain factor to the uplink transmission on the dedicated uplink channel in case the scheduling assignment grants radio resources for uplink transmission on the dedicated uplink channel for a delay-critical service.
32. A method for scheduling in a mobile communication system uplink transmissions on a plurality dedicated uplink channels from a plurality of mobile terminals to a base station, the method comprising the steps of:
 - receiving at the base station scheduling requests for at least a part of said plurality of dedicated uplink channels, wherein a scheduling request comprises a service type indicator indicating the transmission of data of a priority flow carrying a delay-critical service on the dedicated uplink channel and
 - scheduling by the base station those dedicated uplink channels for which a scheduling request has been received, wherein the base station considers a predetermined gain factor to be additionally applied to an uplink transmission on a dedicated uplink channel transporting a delay-critical service when scheduling.
33. A mobile terminal in a mobile communication system indicating uplink resources to be used for transmissions on a dedicated uplink channel, the mobile terminal comprising:
 - communication means for transmitting a scheduling request for the dedicated uplink channel to the base station, wherein a scheduling request comprises a service type indicator indicating the transmission of data of a priority flow carrying a delay-critical service on the dedicated uplink channel and

for receiving a scheduling assignment from the base station for the dedicated uplink channel.

34. A base station in a mobile communication system for scheduling uplink transmissions on a plurality dedicated uplink channels to a base station, the base station comprising:

communication means for receiving scheduling requests for at least a part of said plurality of dedicated uplink channels, wherein a scheduling request comprises a service type indicator indicating the transmission of data of a priority flow carrying a delay-critical service on the dedicated uplink channel and

a scheduler for scheduling the dedicated uplink channels for which a scheduling request has been received, wherein the base station considers a predetermined gain factor to be additionally applied to an uplink transmission on a dedicated uplink channel transporting a delay-critical service when scheduling.

35. A computer readable storage medium for storing instructions that when executed by a processor of a mobile terminal in a mobile communication system cause the mobile terminal to indicate uplink resources to be used for transmissions on a dedicated uplink channel in a mobile communication system, by:

transmitting to the base station a scheduling request for the dedicated uplink channel, wherein a scheduling request comprises a service type indicator indicating the transmission of data of a priority flow carrying a delay-critical service on the dedicated uplink channel and

receiving a scheduling assignment from the base station for the dedicated uplink channel.

36. A computer readable storage medium for storing instructions that when executed by a processor of a base station in a mobile communication system cause the base station to schedule uplink transmissions on a plurality dedicated uplink channels from a plurality of mobile terminals to the base station, by:

receiving scheduling requests for at least a part of said plurality of dedicated uplink channels, wherein a scheduling request comprises a service type indicator indicating the transmission of data of a priority flow carrying a delay-critical service on the dedicated uplink channel and

scheduling the dedicated uplink channels for which a scheduling request has been received, wherein the base station considers a predetermined gain factor to be additionally applied to an uplink transmission on a dedicated uplink channel transporting a delay-critical service when scheduling.